Laboratory Report:

The effect of the number of paperclips on the speed of a roto-copter

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Abstract:

The purpose of this experiment was to test the effect of the number of paperclips on the time it takes a roto-copter to fall 2 metres. A paper roto-copter was made using the template in Figure 1. The number of paperclips attached to the roto-copter was changed (from 1 paperclip to 6 paperclips) and the roto-copter was dropped to the floor from a height of 2 metres. The time to drop was measured in seconds. The results showed that the more paperclips added, the shorter the time to drop.

It took an average of 1.45 seconds to drop with 1 paperclip, and 0.65 seconds to drop with 6 paperclips. Conclusion?

Purpose:

The purpose of this experiment was to test the effect of the number of paperclips on the time it takes a roto-copter to fall 2 metres.

Hypothesis:

The hypothesis was if more paperclips are added to the roto-copter, then the roto-copter will take less time to fall 2 metres, because the increased weight will increase the force of gravity on the roto-copter (Dickinson et al, 2009).

Materials:

-6 paperclips

-8.5 x 11 sheet of white paper

-template for roto-copter (see Figure 1)

-scissors

-measuring tape

Procedure:

Using scissors, the roto-copter was cut out from the template (see Figure 1). The paper was folded on the dotted lines, and a paper clip was attached at the bottom. The roto-copter was dropped from a height of 2 metres above the floor, and the time it took to drop was measured in seconds and recorded in Table 1. This was repeated 3 times. The steps were repeated adding 1 more paperclip each time (i.e. 2 paperclips, 3 paperclips, 4 paperclips, 5 paperclips, 6 paperclips) and the results were recorded in Table 1.

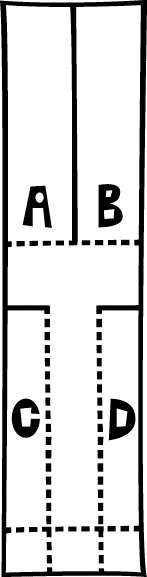


Figure 1. Roto-copter template (“Roto-copter Patterns”, n.d.)

Results:

Table 1. The effect of the number of paperclips on the time for the roto-copter to fall 2 metres.

|  |  |  |  |
| --- | --- | --- | --- |
| The number of paperclips on the roto-copter | The time for the roto-copter to fall 2 metres (seconds) | | |
| Trial 1 | Trial 2 | Trial 3 |
| 1 | 1.38 | 1.68 | 1.31 |
| 2 | 1.22 | 1.40 | 1.19 |
| 3 | 1.13 | 1.40 | 1.30 |
| 4 | 1.16 | 1.0 | 1.09 |
| 5 | .96 | 1.30 | .84 |
| 6 | .63 | .53 | .81 |

Figure 2. The effect of the number of paperclips on the time for the roto-copter to fall 2 metres.

As more paperclips were added, the time for the roto-copter to fall decreased. With 1 paperclip, the average time was 1.45 seconds, with 6 paperclips, the average time was 0.65 seconds.

Discussion:

The relationship between the number of paperclips & the time for the roto-copter to fall.

How the results observed compare to the hypothesis.

Explanation of any differences between what was expected (hypothesis) & what was observed.

Description of any errors in the experimental design.

How the results relate to the purpose.

Conclusion:

The purpose of the experiment was to determine the effect of the number of paperclips on the time for the roto-copter to fall 2 metres to the ground. The results showed that the greater the number of paperclips, the less time it took for the roto-copter to fall to the ground, which supported the hypothesis.

References:

Dickinson, T., Edwards, L., Flood, N., Grace, E., Jackson, C., Mazza, M., Ross, J. (2009). *ON*

*Science 10*. Toronto: McGraw-Hill Ryerson

Roto-copter Patterns. (n.d.). *Exploatorium.* Retrieved from:

<https://www.exploratorium.edu/science\_explorer/roto\_patterns.html>